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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/719,968   | 11/21/2003  | S. Ben Choi          | 1-24440             | 3571             |
| 46582  | 7590        | 10/28/2005           | EXAMINER            |                  |
| MACMILLAN, SOBANSKI & TODD, LLC<br>ONE MARITIME PLAZA - FOURTH FLOOR<br>720 WATER STREET<br>TOLEDO, OH 43604 |             |                      | SUN, XIUQIN         |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2863                |                  |

DATE MAILED: 10/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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|                              |                          |                                  |
|------------------------------|--------------------------|----------------------------------|
| <b>Office Action Summary</b> | <b>Application No.</b>   | <b>Applicant(s)</b>              |
|                              | 10/719,968<br>Xiuqin Sun | CHOI, S. BEN<br>Art Unit<br>2863 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 02 September 2005.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-12,14-22 and 24-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 2-12,14-22 and 24-26 is/are allowed.
- 6) Claim(s) 1 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 21 November 2003 is/are: a) accepted or b) objected to by the Examiner. Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Waston (U.S. Pub. No. 20030182041) in view of Fukatani (U.S. Pat. No. 5765118).

Waston teaches a method for estimating a propensity of a vehicle to rollover, the method comprising the steps of: determining lateral kinetic energy of said vehicle (sections 0101 and 0102); measuring a lateral acceleration of said vehicle (section 0030, lines 1-7); and determining a rollover potentiality index in response to said lateral kinetic energy value and said lateral acceleration (section 0033, lines 7-15; section 0179, lines 13+ and section 0181).

Waston does not disclose expressly: said lateral kinetic energy of said vehicle is determined in response to vehicle longitudinal velocity and vehicle side slip angle.

Fukatani teaches an algorithm for determining a lateral speed, from which a lateral kinetic energy of a vehicle can be determined, in response to vehicle longitudinal velocity and vehicle side slip angle (col. 10, lines 7-11).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Waston's algorithm as taught by Fukatani to determine lateral kinetic energy of said vehicle in response to vehicle longitudinal velocity and vehicle side slip angle for the purpose of simulating a vehicle rollover condition more accurately (Fukatani, cols. 9-10, lines 66-11).

***Allowable Subject Matter***

3. Claims 2-12, 14-22 and 24-26 are allowed.

***Reasons for Allowance***

4. The following is an examiner's statement of reasons for allowance:

The primary reason for the allowance of claims 2-12 and 14 is the inclusion of the method step of determining a rollover index by weighting said rollover potentiality index by a factor of said lateral acceleration. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 15-22 is the inclusion of the limitation of a controller for determining a side slip angle and for determining a rollover potentiality index in response to weighting said rollover potentiality index by a factor of a measured lateral acceleration for determining a rollover index. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught

or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 25 is the inclusion of the method step of determining a rollover index by weighting said rollover potentiality index by a factor of said lateral acceleration; wherein said rollover potentiality index is represented by the formula:

$$\phi_0 = \frac{1}{2} |V_x \beta|^2 - \sqrt{g^2 + a_m^2} \sqrt{d^2 + h^2} + d a_m + h g ,$$

where  $V_x$  is said vehicle longitudinal velocity,  $\beta$  is said vehicle side slip angle,  $g$  is a gravity constant,  $a_m$  is said measured lateral acceleration,  $d$  is one half a vehicle track width, and  $h$  is a nominal center of gravity height. It is this limitation found in the claim, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

The primary reason for the allowance of claims 24 and 26 is the inclusion of the limitation of a controller for determining a side slip angle and for determining a rollover potentiality index in response to weighting said rollover potentiality index by a factor of a measured lateral acceleration for determining a rollover index; wherein said rollover potentiality index is represented by the formula:

$$\phi_0 = \frac{1}{2} |V_x \beta|^2 - \sqrt{g^2 + a_m^2} \sqrt{d^2 + h^2} + d a_m + h g ,$$

where  $V_x$  is said vehicle longitudinal velocity,  $\beta$  is said vehicle side slip angle,  $g$  is a gravity constant,  $a_m$  is said measured lateral acceleration,  $d$  is one half a vehicle track width, and  $h$  is a nominal center of gravity height. It is this limitation found in each of the

claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### ***Response to Arguments***

6. Applicant's arguments received 09/02/05 with respect to claim 1 has been considered but they are not persuasive.

The Examiner's position is that the Waston reference teaches the claimed invention recited in claim 1 except that said lateral kinetic energy of the vehicle is determined in response to vehicle longitudinal velocity and vehicle side slip angle. The Fukatani patent teaches determining a lateral speed in response to vehicle longitudinal velocity and vehicle side slip angle. It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Fukatani in the invention of Waston to calculate the lateral kinetic energy in response to vehicle longitudinal velocity and vehicle side slip angle, since it is well known that lateral kinetic energy is dependent upon the square of the lateral speed, and the lateral speed, in this case, can be calculated in response to vehicle longitudinal velocity and vehicle side slip angle, as taught by Fukatani.

***Contact Information***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuqin Sun whose telephone number is (571)272-2280. The examiner can normally be reached on 6:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571)272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Xiuqin Sun  
Examiner  
Art Unit 2863

XS   
October 25, 2005

MICHAEL NGHIEM  
PRIMARY EXAMINER